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EXAMINER
CORRIGAN, JAIME W

ART UNIT	PAPER NUMBER
3748	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/870,619	KATAYAMA, GOICHI
	Examiner	Art Unit
	Jaime W Corrigan	3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-19,21,23-27 and 30-59* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 5-19, 21, 23-27, 30-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the Amendment filed on 09 March 2004. Claim 37 has been amended. Claims 4, 20, 22, 28-29 have been cancelled. The indicated allowability of some of the claims has been reconsidered, and a new Non-final rejection is set forth below. Overall, claims 1-3, 5-19, 21, 23-27, 30-59 are pending in this application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5-11, 13-19, 21, 23-27, 30-36, 41-43, 48-54 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakamura (PN 5,797,363).

Regarding claim 1 Nakamura discloses an internal combustion engine (See Abstract) for an outboard motor comprising at least one combustion chamber (Inherent in all internal combustion engines) formed by at least an engine body (See Figure 5 (12)), a cylinder head assembly (See Figure 5 (19)) and a piston (Inherent in all internal combustion engines) that moves relative to the engine body and the cylinder head assembly, a crankshaft (See Figure 3 (20)) that extends in a generally vertical direction and is coupled to the piston

such that movement of the piston causes the crankshaft to rotate, a port (Inherent in all internal combustion engines) that is communication with the combustion chamber, a valve (See Figure 3 (17), (18)) moveable between open and closed positions of the port, a camshaft (See Figure 3 (15), (16)) that is journaled for rotation and extends generally parallel (See Figure 3 (15), (16), (20)) to the crankshaft, the camshaft including at least one cam (See Column 3 Lines 4-6) configured to open and close the valve, a rotor (See Figure 2 (35)) attached an upper end of the camshaft and being positioned for at least partial rotation (See Column 3 Lines 17-19) within a housing (See Figure 2 (39)), the rotor defining at least a first space (See Figure 2 (53)) and a second space (See Figure 2 (54)) within said housing, a driven member (See Figure 3 (26)) coupled to the housing, a drive member (See Figure 3 (25))coupled to an upper end of the output shaft (See Figure 3 (20)), the drive member coupled (See Column 2 Lines 66-67, Column 3 Line 1) to the driven member such that rotation of the drive member is transmitted to the driven member, a control valve (See Figure 1 (32)) positioned within a common hydraulic passage having a first opening (See Figure 4 (69)) and a second opening (See Figure 4 (70)), and a first hydraulic passage (See Figure 4 (55)) and a second hydraulic passage (See Figure 4 (56)), the first hydraulic passage in communication with the first space (See Column 4 Lines 17-23) and the first opening (See Column 4 Lines 65-67) and the second hydraulic passage in communication with the second space (See Column 4 Lines 41-56) and second opening (See Column 4 Lines 65-67), the control valve (See Figure 4 (32)) being configured to selectively open and close the first

and second openings (See Column 4 Lines 62-67, Column 5 Lines 1-3) such that hydraulic fluid is preferentially supplied to either the first space or the second space (See Column 5 Lines 4-22), the control valve also being positioned generally along an axis that is perpendicular (See Figure 1 (16), (32); Figure 4 (32)) to the camshaft, and a bearing cap (See Figure 1 (33)) located near an upper end of the camshaft, the bearing cap configured to cooperate with the cylinder head assembly so as to support the camshaft for rotation and at least a portion (See Figure 1 (60), Column 4 Lines 42-53) of the common hydraulic passage being formed in the bearing cap.

Regarding claim 2 Nakamura discloses the control valve is also positioned generally along an axis that extends transversely (See Figure 1 (16), (32); Figure 4 (32), (12)) across the engine.

Regarding claim 3, 21, 39 Nakamura discloses the control valve (See Figure 1 (32), (16)) is positioned near an upper end of the camshaft.

Regarding claims 5, 23, 41 Nakamura discloses at least a portion of the first hydraulic passage and second hydraulic passage are formed in the bearing cap (See Figure 1 (55), (56), (60)).

Regarding claims 6, 17, 24, 35, 42, 53 Nakamura discloses the port is an intake port (See Abstract), the valve is an intake valve and the camshaft is an intake camshaft (See Figure 1 (16)).

Regarding claims 7, 18, 25, 36, 43, 54 Nakamura discloses an exhaust port (See Abstract), an exhaust valve and an exhaust camshaft that extends generally parallel to the intake camshaft, wherein the bearing cap (See Figure 1 (33)) is also configured to cooperate with the cylinder head assembly to support the exhaust camshaft for rotation, the bearing cap having a single integral body.

Regarding claims 8, 26, Nakamura discloses a cylinder head cover and wherein the control valve (See Figure 1 (32)) extends through an opening in the cylinder head cover.

Regarding claims 9, 27 Nakamura discloses the opening in the head cover (See Figure 5 (77)) includes a lip and a sealing member positioned between the lip and the control valve (See Figure 1 (32)).

Regarding claims 10 Nakamura discloses a lubrication system (See Figure 1 (60), (65)) and lubrication passages, the lubrication passages including a supply (See Figure 1 (65)) passage that is in communication with the common passage.

Regarding claims 11 Nakamura discloses the supply (See Figure 1 (65)) passage is defined, at least in part, in the cylinder head (See Figure 1 (19)) assembly.

Regarding claims 13, 31, 49 Nakamura discloses a filter (See Figure 1 (66)) positioned in the supply passage.

Regarding claims 14, 32, 50 Nakamura discloses the filter (See Figure 1 (66)) is positioned in a filter bore that has an opening on a contact face between the cylinder head assembly (See Figure 1 (19)) and the bearing cap (See Figure 1 (33)).

Regarding claims 15, 33, 51 Nakamura discloses the filter (See Figure 1 (66)) is positioned in the bearing cap (See Figure 1 (33)).

Regarding claims 16, 34, 52 Nakamura discloses the filter (See Figure 1 (66)) is positioned in the cylinder head assembly (See Figure 1 (19)).

Regarding claims 12, 19, 30, 48 Nakamura discloses an internal combustion engine (See Abstract) for an outboard motor comprising at least one combustion chamber (Inherent in all internal combustion engines) formed by at least an engine body (See Figure 5 (12)), a cylinder head assembly (See Figure 5 (19)) and a piston (Inherent in all internal combustion engines) that moves relative to the engine body and the cylinder head assembly, a crankshaft (See

Figure 3 (20)) that extends in a generally vertical direction and is coupled to the piston such that movement of the piston causes the crankshaft to rotate, a port (Inherent in all internal combustion engines) that is communication with the combustion chamber, a valve (See Figure 3 (17), (18)) moveable between open and closed positions of the port, a camshaft (See Figure 3 (15), (16)) that is journaled for rotation and extends generally parallel (See Figure 3 (15), (16), (20)) to the crankshaft, the camshaft including at least one cam (See Column 3 Lines 4-6) configured to open and close the valve, a rotor (See Figure 2 (35)) attached an upper end of the camshaft and being positioned for at least partial rotation (See Column 3 Lines 17-19) within a housing (See Figure 2 (39)), the rotor defining at least a first space (See Figure 2 (53)) and a second space (See Figure 2 (54)) within said housing, a driven member (See Figure 3 (26)) coupled to the housing, a drive member (See Figure 3 (25)) coupled to an upper end of the output shaft (See Figure 3 (20)), the drive member coupled (See Column 2 Lines 66-67, Column 3 Line 1) to the driven member such that rotation of the drive member is transmitted to the driven member, a control valve (See Figure 1 (32)) positioned within a common hydraulic passage having a first opening (See Figure 4 (69)) and a second opening (See Figure 4 (70)), and a first hydraulic passage (See Figure 4 (55)) and a second hydraulic passage (See Figure 4 (56)), the first hydraulic passage in communication with the first space (See Column 4 Lines 17-23) and the first opening (See Column 4 Lines 65-67) and the second hydraulic passage in communication with the second space (See Column 4 Lines 41-56) and second opening (See Column 4 Lines 65-67), the

control valve (See Figure 4 (32)) being configured to selectively open and close the first and second openings (See Column 4 Lines 62-67, Column 5 Lines 1-3) such that hydraulic fluid is preferentially supplied to either the first space or the second space (See Column 5 Lines 4-22), the control valve also being positioned generally along an axis that is perpendicular (See Figure 1 (16), (32); Figure 4 (32)) to the camshaft, the engine further comprising a lubrication (See Column 2 Lines 45-48) system and lubrication passages (See Figure 1 (60), (62), (65), the lubrication passages including a supply (See Figure 1 (60), (65)) passage that is in communication with the common passage (See Figure 4 (55), (56)), wherein the supply passage (See Figure 1 (60), (65)) is defined, at least in part, in the cylinder head (See Figure 1 (19)) assembly and a bearing cap (See Figure 1 (33)) that is located near an upper end of the camshaft, the bearing cap configured to cooperate with the cylinder head assembly so as to support the camshaft for rotation (See Column 3 Lines 17-18).

Regarding claim 21 Nakamura discloses the control valve (See Figure 1 (32)) is near an upper end of the camshaft (See Figure 1 (16)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which

said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 37-40, 44-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura (PN 5,797,363).

Regarding claim 37 Nakamura discloses an internal combustion engine for an outboard motor comprising an engine body (See Figure 5 (12)), a piston (Inherent in all internal combustion engines) movable relative to the engine body, a crankshaft (See Figure 3 (20)) that extends in a generally vertical direction and is journaled for rotation by the piston, the engine body, the piston and a cylinder head (See Figure 1 (19)) assembly together defining a combustion chamber (Inherent in all internal combustion engines), a port (Inherent in all internal combustion engines) in communication with the combustion chamber, a valve (See Figure 3 (18)) movable between open and closed positions of the port, a camshaft (See Figure 1 (16)) that extends generally parallel to the crankshaft and is journaled for rotation to actuate the valve in a set angular position, a variable valve timing mechanism (See Figure 1 (11)) arranged to set the camshaft to an angular position between a first angular position and a second angular portion (See Abstract), the first angular position being advanced (See Column 5 Lines 10-23) as compared to the second angular position, the variable valve timing mechanism comprising a setting section- (See Figure 1 (35), (39)), a supply section (See Figures 1, 4 (55), (56), (60)-(64)) and a control section (See Figure 1 (32)), the control section comprising a control valve (See Figure 1 (32)) that is disposed on along an axis that is generally perpendicular to the camshaft (See Figure 1 (32), (16)), the supply section comprising a first hydraulic passage (See

Figure 1 (55, (65), Column 4 Lines 18-26) and a second hydraulic passage (See Figure 1 (56), (60), (64), Column 4 Lines 54-67) that are in hydraulic communication with the setting section (See Figure 1 (56), (60), (64), Column 4 Lines 54-67) and the control section (See Figure 1 (56), (60), (64), Column 4 Lines 54-67), the first (See Figure 1 (55, (65), Column 4 Lines 18-26) hydraulic passage and the second hydraulic passage not (See Figure 1 (56), (60), (64), Column 4 Lines 54-67) extending below a generally horizontal plane that lies normal to the axis of the camshaft and that contains a central axis that extends through the control valve (See Figure 1 (32)), wherein the valve is positioned below the generally horizontal plane and the setting section is positioned above the generally horizontal plane.

Regarding claim 38 Nakamura discloses the control valve is also positioned generally along an axis that extends transversely across the engine (See Figure 1 (16), (32)).

Regarding claim 39 Nakamura discloses the control valve is positioned near an upper end of the camshaft (See Figure 1 (16), (32)).

Regarding claim 40 Nakamura discloses a bearing cap (See Figure 1 (33)) located near an upper end of the camshaft, the bearing cap configured to cooperate with the cylinder head assembly so as to support the camshaft for rotation (See Column 3 Lines 17-21).

Regarding claim 44 Nakamura discloses a cylinder head cover (See Figure 3 (12), (19)) and wherein the control valve extends through an opening in the cylinder head cover (See Figure 1 (32), (19)).

Regarding claim 45 Nakamura discloses the opening in the head cover (See Figure 1 (32), (19)) includes a lip (See Figure 4 (70)) and a sealing member (See Figure 4 (72)) positioned between the lip and the control valve.

Regarding claim 46 Nakamura discloses a lubrication system (See Figures 1, 4 Column 2 Lines 45-50) and lubrication passages (See Figure 1 (55, (65), (60), (60)-(64), Column 4 Lines 18-26), the lubrication passages including a supply passage (See Figure 1 (55), (65), (60), (60)-(64), Column 4 Lines 18-26) that is in communication with the control section (See Figure 1 (32)).

Regarding claim 47 Nakamura discloses the supply passage is defined, at least in part, in the cylinder head assembly (See Figure 1 (33), (55), (65), (60), (60)-(64), Column 4 Lines 18-26).

Nakamura discloses the claimed invention except for "the first (See Figure 1 (55, (65), Column 4 Lines 18-26) hydraulic passage and the second hydraulic passage not (See Figure 1 (56), (60), (64), Column 4 Lines 54-67) extending below a generally horizontal plane that lies normal to the axis of the camshaft

and that contains a central axis that extends through the control valve (See Figure 1 (32)), wherein the valve is positioned below the generally horizontal plane and the setting section is positioned above the generally horizontal plane" in claim 37. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have placed the valves below the horizontal line and the setting section above the horizontal line since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

Claims 55-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura (PN 5,797,363) in view of Hiroaki et al. (JP 11-132016).

Nakamura discloses an internal combustion engine for an outboard motor comprising at least one combustion chamber (Inherent in all internal combustion engines) formed by at least a engine body, a cylinder head (See Figure 1 (19)) assembly and a piston that moves relative to the engine body and the cylinder head assembly, a crankshaft (See Figure 3 (20)) that extends in a generally vertical direction and is coupled to the piston such that movement of the piston causes the crankshaft to rotate, a port (Inherent in all internal combustion engines) that is in communication with the combustion chamber, a valve (See Figure 3 (18)) moveable between open and closed positions of the port, a camshaft that is journaled for rotation and extends generally parallel to the crankshaft, the camshaft (See Figure 1 (16)) including at least one cam configured to open and close the valve, a rotor (See Figure 1 (35)) attached to an

upper end of the camshaft and being positioned for at least partial rotation within a housing, the rotor defining at least a first space (See Figure 2 (53)) and a second (See Figure 2 (54)) space within said housing, a driven member (See Figure 3 (26)) coupled to the housing, a drive (See Figure 3 (25)) member cou0led to an upper end of the output shaft, the drive member coupled to the driven member such that rotation of the drive member is transmitted to the driven member, a control valve (See Figure 1 (32)) positioned within a common hydraulic passage having a first opening (See Figure 4 (69)) and a second opening (See Figure 4 (70)), and a first hydraulic passage (See Figure (55)) and a second hydraulic (See Figure 4 (56)) passage, the first hydraulic passage in communication (See Column 4 Lines 17-23) with the first space and first opening (See Column 4 Lines 65-67) and the second hydraulic passage in communication (See Column 4 Lines 41-67) with the second space and second opening.

Nakamura fails to disclose the control valve in the cylinder head cover; actuator portion extends through cover; control valve on side of camshaft opposite of the valve; control valve below horizontal plane which extends through portion of setting section of timing mechanism; camshaft plurality of cams, control valve above a horizontal plane that extends through an uppermost valve.

Hiroaki teaches that it is conventional in the art to utilize the control valve (See Figure 4 (12)) comprising an actuator portion and a valve portion (See

Figure 4 (20)), the control valve configured to selectively open and close the first and second openings such that hydraulic fluid is selectively supplied to either the first space or the second space, and a cylinder head cover (See Figure 4 (1)), the valve portion of the control valve lying within the cylinder head cover (See Figure 4 (20)); actuator portion extends through cover (See Figure 4 (20), (8)); control valve on side of camshaft opposite of the valve (See Figure 4 (20), (3)); control valve below horizontal plane which extends through portion of setting section of timing mechanism (See Figure 4 (20), (4), (49)); camshaft plurality of cams, control valve above a horizontal plane that extends through an uppermost valve (See Figure 4 (20), (3)).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the control valve in the cylinder head cover taught by Hiroaki in the Nakamura device since it would improve access to the control valve and improve timing device performance.

Response to Arguments

Applicant's arguments with respect to claims 1-3, 5-19, 21, 23-27, 30-59 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication from the examiner should be directed to Examiner Jaime Corrigan whose telephone number is (703) 308-

2639. The examiner can normally be reached on Monday - Friday from 8:30 a.m. – 6:00 p.m. 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reached on (703) 308-2623. The fax number for this group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0861.

JC

Jaime Corrigan
Patent Examiner

June 01, 2004

Art Unit 3748

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